Network Implementation Project

Right of Way & Fleet Maintenance Department

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Computer communication in most organizations is changing rapidly in response to new technologies, evolving business requirements and the need for "instant" knowledge transfer. Today's internetworks combine a variety of devices, media types, and transmission methods. The internetwork of a company must be flexible, scalable and adaptable to suit its organizational needs. The City of Houston continues to use technology to reduce cost, limit growth to the workforce, improve services to citizens and employees, and reduce the risk of business disruptions and security breeches.

Cisco Builds 21st Century Network

There were various types of systems supporting the operating mainframe for data processing among the different departments. What the City needed was a network that would permit all the dissimilar systems to communicate. DYONYX was selected as the information technology integrator. The company proposed to lead the Network Implementation Project in upgrading the City's Cisco network infrastructure, routers, switches, firewall connections, Ethernet and CAT 5 cabling. Before Cisco was introduced, the City relied on an X.25- based network from AT&T. Its slow performance was too much to handle as the City's client/server systems grew and required higher bandwidths to conduct its functions. The City proposed to replace the X.25

network, integrate it with two existing fiber-optic networks and create a cohesive WAN that would support all the city's diverse operations. This proposal would take the old departmental network and rebuild it with a network that would support the requirements entering the 21st century.

Network Implementation Project Overview

The City of Houston had a mix of new and old computer systems before they decided to upgrade its existing network infrastructure affecting over 22 departments in a three phase project over a five year span. The Networking Implementation Project's ultimate goal was to provide better reliable connections, decrease downtime, increase security and provide room for future expansion thus laying the foundation for a wide variety of improved public services.

Phase I: Preparation Phase

The first phase of the Network Implementation Project was to meet and plan out every step thoroughly. It was during these meetings that the NIP team would plan out ideas and discuss any concerns or issues. These meetings helped ensure that the project run smoothly. One of the first tasks required of the project asked that every site be surveyed to identify the exact hardware (computers, servers, network printers) being affected. The hardware needed to be identified and labeled in order to

generate an inventory list. By doing so a hardware topology map could be created by a DS Services Project Manager. With this hardware topology map it was clearer to picture what equipment would be needed to convert each site over to the new network. It would identify what applications resided on the equipment and how it would be affected once the IP address changed. A DCS reference number and a crew were then assigned to each location. Based on the creation of the inventory list the team realized that the excess switches and hubs needed to be removed from each workstation. These devices were allowing a single user to connect multiple external peripherals thus creating network traffic. Network security was enhanced by assigning each workstation a single port. Through this port the PC's MAC address is tracked for each established connection.

Phase II: PWE Data Center Cutover

The cutover phase of the project occurred overnight when there was no network activity. During this time out of date network devices such as switches and routers were removed and the upgraded Cisco equipment was installed. DC Services was in charge of removing all the CAT5 cabling and installing CAT6. Fiber Optic cable was installed to provide faster more reliable connections to distant locations. (i.e. Renwick)

roject, which consist of all cable that was pulled via data or network any racks that had to be moved are added any labor that was done they did it.

During the project cutover period existing equipment will the shut down for around 6 hours, depending on the size of the site.

Cables will also all be upgraded and be color coordinated, yellow cables connect to PCs and green connects printers, servers and other network devices. Standardizing the equipment will make it easier to manage and troubleshoot in the future. Existing network port drops that are inactive can be activated if requested.

FYI…. DCS is an out source company that was contracted through the City Of Houston to handle this project, which consist of all cable that was pulled via data or network any racks that had to be moved are added any labor that was done they did it.

Phase III: Clean Up & Residual Issues

In the post N.I.P phase, final touches are made to ensure everything is completed. Every network device such as PCs and network printers will be tested for connectivity. Once this testing is done the official cut over is complete. After the fact, the additional network port drops requested in the planning phase are installed at a later date.

As for the cleanup of each site DCS was responsible for removing any cable that was not used and making sure that no left over were onsite after everything was completed.

PUD - ITD was responsible for the application and the clients being able to access their software once the new IP was changed on PUD side.

MROW - IT was responsible for the application and the clients being able to access their software once the IP was changed on MROW side.

Benefits of NIP

The Networking Implementation Project provided many benefits to the City of Houston that would allow it to remain competitive in the market. Network scalability was made possible by having additional ports accessible for future demand. Even with expansion security will remain a top priority. The same regulation of one port per workstation will apply. Increased reliability in connection speed will gear toward fiber optic technology completely eliminating CAT6 cabling. Advances in software were also made possible by upgrading from MS Office 2003 to MS Office 2007, which will operate more coherently with the network upgrade.

At the end of the NIP project every City employee will be co. Each employee is designated a single port. By assigning one user to a single PC and that PC to a single network port, port security can be established. The unique MAC address in every network device's network card is used to restrict access to that specific device. This will prevent anyone from bringing in a device from home and connecting to the network with it.

Conclusion

Information technology is essential to integrate companies and their corresponding departments to operate as a whole. Companies will continue to upgrade their IT systems to remain competitive and operational in our fast paced ever-changing environment. The City of Houston will continue to support and improve their operations with the new NIP upgrade.